



# DISABILITY ASSESSMENT IN KARATE PRACTITIONERS HAVING LOW BACK PAIN USING OSWESTRY LOW BACK PAIN DISABILITY QUESTIONNAIRE

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**Abstract:** *Background and objective:* Karate is one of the most participated sports in the world. It has rich history tracing back to China and India. Combat sports are characterized by high-intensity and long trainings, and require a high degree of mental concentration, which combined with the frequent shortening of the time needed for tissue regeneration, can place a significant overload on the lumbar spine. Low back pain is extremely common, not only among the general population but also among athletes. The most common causes of lumbar pain include inadequate biochemical patterns, muscle imbalance, improper warm ups, inadequate training leading to repeated micro injuries. Therefore, the objectives of this research were to assess the level of disability of low back pain in Karate practitioners using Oswestry Low Back Pain Disability Questionnaire. *Materials and Methods:* The study was conducted on a group of karate practitioners whose age ranged from 18 to 35 years with years of experience between 2 and more years. Oswestry low back pain disability questionnaire was used to assess level of disability for low back pain. *Results:* We had 46 males and 14 females out of 60 participants in our study. The study showed 10 participants had moderate disability and 50 participants had minimal disability. *Conclusions:* Low Back Pain commonly occurs in karate practitioners. Based on the study's results it can be concluded that low back pain has minimal disability in karate practitioners.

**Index Terms** - Karate, Low back pain (LBP), Oswestry low back pain disability questionnaire.

## INTRODUCTION

Martial art is mainly based on hand fighting with the forms of martial art skills and battle. Although martial art includes rich skills, it aims to enhance people's physical quality and defense capability by practice.<sup>[1]</sup> There are different forms of martial art depending on style, origin, equipment used etc.<sup>[1]</sup> Some of the martial prevalent in India are, Karate, judo and some more.<sup>[1]</sup>

Karate is one of the most participated sports in the world. It has rich history tracing back to China and India.<sup>[2]</sup> Since starting time of karate, karate players wear "Traditional karate uniform" which is called "Karate GI".<sup>[2]</sup> Karate is a martial arts discipline which originated in Okinawa, Japan.<sup>[3]</sup> It is currently widespread all over the world.<sup>[3]</sup> There are over one hundred karate styles.<sup>[3]</sup> Karate training comprises the following elements: kihon – basic techniques, kumite – combat, and kata, which means "basic form" in Japanese.<sup>[3]</sup> It is a sequence of specific movements used for defense and attack.<sup>[3]</sup> These techniques were developed by great masters and are always performed in the same order.<sup>[3]</sup>

Performing dynamic rotational movements of the torso in the zenkutsu-dachi, kokutsu-dachi and kiba-dachi stances may be the reason for overloading the lumbar spine.<sup>[3]</sup> Factors which lead to the occurrence of back pain include hard physical work, lifting and carrying heavy objects, forced static body postures and work which involves rotational movements of the torso.<sup>[3]</sup>

Combat sports are characterized by high-intensity and long trainings, and require a high degree of mental concentration, which combined with the frequent shortening of the time needed for tissue regeneration, can place a significant overload on the lumbar spine.<sup>[4]</sup> The most common causes of lumbar and sacral pain include inadequate biomechanical patterns, muscle imbalance, improper warm-ups, technical errors, and inadequate training, leading to repeated micro-injuries.<sup>[4]</sup> Low back pain syndromes disappear spontaneously within 3 months in 90% of cases; however, they are often recurrent (in 50% of the population) and can develop into a chronic condition.<sup>[4]</sup> Lifestyle, occupation, and incorrectly performed exercise have a significant impact on the increase in spinal pain. Psychosocial factors, such as anxiety, stress, and depression, significantly extend the duration of the ailment and contribute to the transition from an acute to a chronic condition.<sup>[4]</sup>

Low back pain is extremely common, not only among the general population but also among athletes.<sup>[4]</sup> According to Okada et al.<sup>[5]</sup>, 30–85% of all athletes suffer from low back pain and in combat sports, back pain occurs in judokas and karate practitioners, who are the subject of this study.<sup>[5]</sup>

Although there have been few reports to examine the mechanism of LBP in karate athletes, karate which is considered a combat sport and direct trauma is one of the causes of LBP.<sup>[6]</sup> Studies report that 46% of all karate injuries occur during sparring sessions in training situations, and 13.3% of all karate injuries are back injuries.<sup>[7]</sup>

Almost all former studies have evaluated the prevalence of low back pain in developed countries whose conclusions may not hold for underdeveloped or developing countries.<sup>[8]</sup> Present study aims to assess the level of disability of low back pain in karate practitioners.

## NEED OF STUDY

Karate is a trendy form of martial art that has gained incredible popularity in Korea, Japan, China and India.<sup>[11]</sup>

Low back pain is extremely common, not only among the general population but also among athletes.<sup>[4]</sup> There are studies which shows low back pain is the highest in male and female karate athletes.<sup>[3,8]</sup>

The most common causes of lumbar pain include inadequate biochemical patterns, muscle imbalance, improper warm ups, inadequate training leading to repeated micro injuries.<sup>[4]</sup>

Studies have shown 44% of Karate players had reported low back pain for which they had to visit LBP specialist and use medications.<sup>[8]</sup> Studies have also shown out of 82% musculoskeletal pain reported by male karate athletes 11% had pain in lumbar spine.<sup>[3]</sup>

Although many articles and studies regarding low back pain in karate have been published till now, there is lack of studies in Indian context. Hence, we are assessing the level of disability of low back pain in Karate practitioners using Oswestry Low Back Pain Disability Questionnaire.

## AIM

To assess the level of disability of low back pain in Karate practitioners using Oswestry Low Back Pain Disability Questionnaire.

## OBJECTIVE

To assess the level of disability of low back pain in Karate practitioners using Oswestry Low Back Pain Disability Questionnaire.

## METHODOLOGY

**STUDY DESIGN** : Cross Sectional Study  
**SAMPLING METHOD** : Convenience Sample Design.  
**SAMPLE SIZE** : 60  
**STUDY SETUP** : Karate Training Centre, Thane.

## INCLUSION CRITERIA:

1. Age group - 18 to 35 years old.
2. Karate practitioners with experience of 2 and more years.
3. Low Back Pain with Visual Analogue Scale: 1-10.<sup>[12]</sup>

**EXCLUSION CRITERIA:**

1. Past injuries and surgeries in lumbar spine area.
2. Neurological diseases.

**MATERIALS:**

Consent Form, Demographic Data, Visual Analogue Scale.

**OUTCOME MEASURES:**

Oswestry Low Back Pain Disability Questionnaire.

**PROCEDURE**

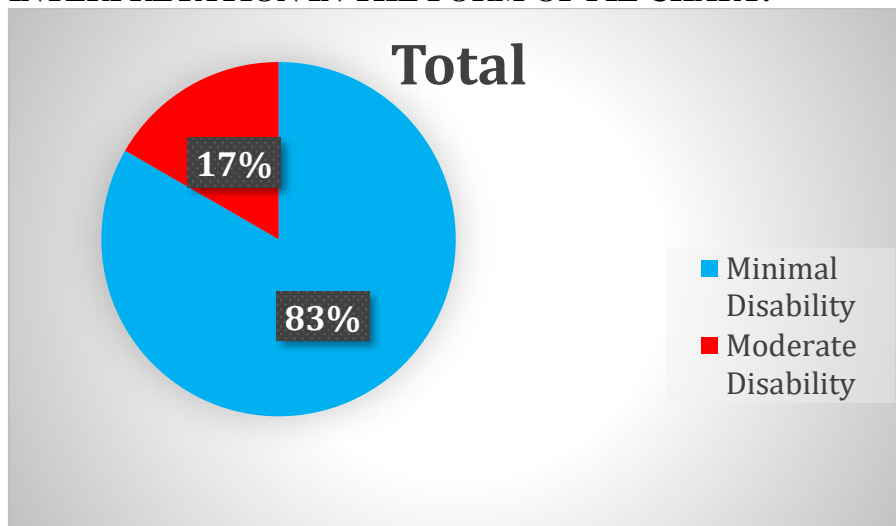
1. An approval will be taken from the ethics committee of Lokmanya Tilak College of Physiotherapy, Kharghar.
2. The permission will be obtained from the Karate Branch Sensei to carry out research study among them.
3. Consent will be taken from Karate practitioners. Those who are willing and fulfilling the inclusion criteria will be included as a part of the research study.
4. The selected participants for the study will be explained about the need and procedure of research.
5. Oswestry Low Back Pain Disability Questionnaire will be given to the participants having low back pain.
6. Data will be further statistically analyzed.

**STATISTICAL ANALYSIS AND RESULTS**

**TABLE NO.:1 – MEAN AND STANDARD DEVIATION OF AGE, VISUAL ANALOGUE SCALE AND OSWESTRY LOW BACK PAIN DISABILITY QUESTIONNAIRE SCORES.**

TABLE NO.:1	AGE	VISUAL ANALOGUE SCALE	OSWESTRY LBP DISABILITY QUESTIONNAIRE SCORES
MEAN	23	4	6
STANDARD DEVIATION	6	2	3

**PIE CHART – 1: OSWESTRY LOW BACK PAIN DISABILITY QUESTIONNAIRE INTERPRETATION IN THE FORM OF PIE CHART.**

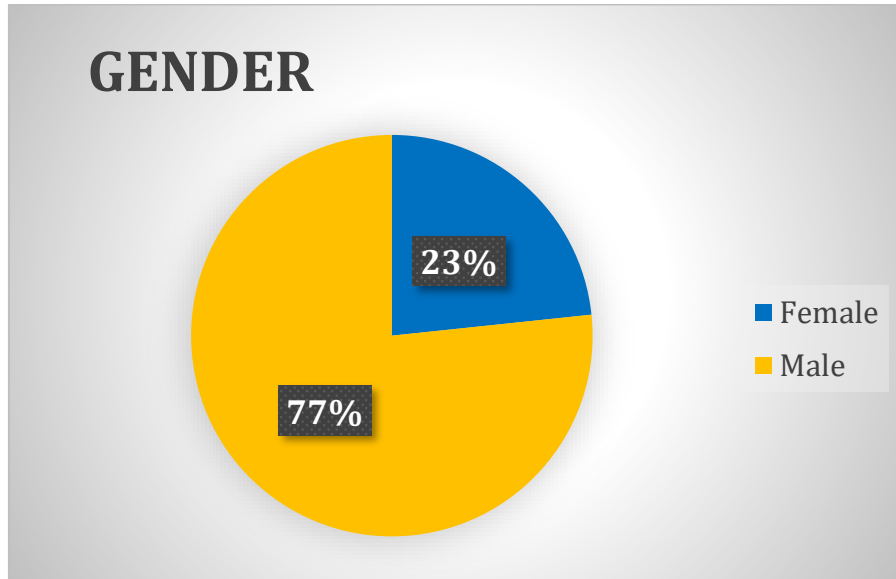


**TABLE NO.2: OSWESTRY LOW BACK PAIN DISABILITY QUESTIONNAIRE INTERPRETATION IN THE FORM OF TABLE.**

Oswestry LBP Disability Questionnaire Interpretation	No. of Samples
Minimal Disability	50
Moderate Disability	10

INTERPRETATION – This pie chart shows that out of the 60 participants 83% (50) karateka has **MINIMAL DISABILITY** and 17% (10) has **MODERATE DISABILITY**.

**PIE CHART- 2: GENDER DISTRIBUTION IN THE FORM OF PIE CHART**

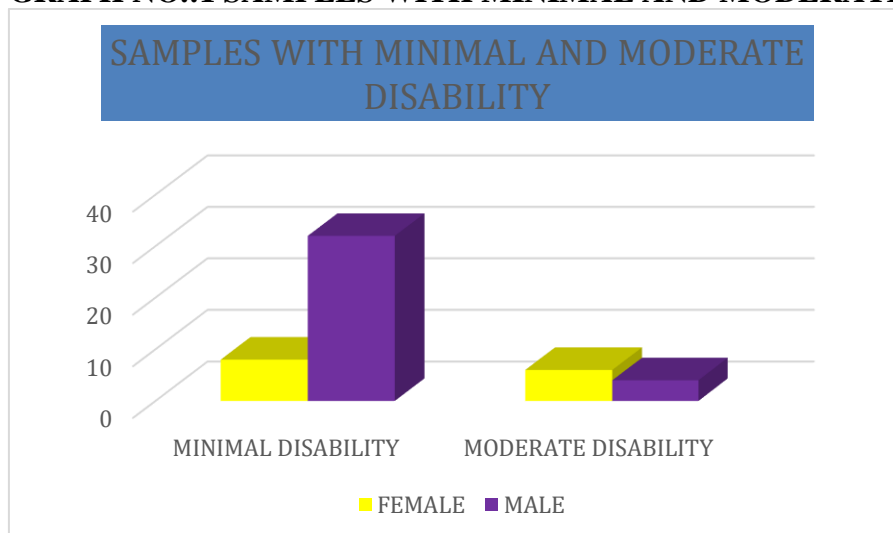


**TABLE NO.3: GENDER DISTRIBUTION THE FORM OF PIE CHART**

GENDER	COUNTS
Female	14
Male	46
<b>Grand Total</b>	<b>60</b>

INTERPRETATION – This pie chart shows that out of the 60 participants 77% (46) were **MALES** and 23% (14) were **FEMALES**.

**GRAPH NO.:1 SAMPLES WITH MINIMAL AND MODERATE DISABILITY**



INTERPRETATION – THIS GRAPH SHOWS 8 FEMALES AND 42 MALES HAS MINIMAL DISABILITY AND 6 FEMALES AND 4 MALES HAS MODERATE DISABILITY.



The above picture shows the examiner is explaining participant about the research study and Oswestry Low Back Pain Questionnaire Scale.

## RESULTS

- Microsoft Excel was used for data collection and validation.
- In our study, out of 60 participants., we had 46 males and 14 females.
- 10 (17%) participants had moderate disability and 50 (83%) participants had minimal disability using Oswestry low back pain disability questionnaire.
- Among the female participants (14), 6 experienced moderate disability and 8 experienced minimal disability.
- Among the male participants (46), 4 experienced moderate disability and 42 experienced minimal disability.
- The statistical analysis of the low back pain disability questionnaire was represented in the form of pie chart.
- Hence, the hypothesis is proved that there is significant low back pain disability in Karate practitioners.

## DISCUSSION

Descriptive analysis was used to summarize the data collected in simple numerical form using Microsoft Excel. This study was done to assess the level of disability in karate practitioners using Oswestry low back pain disability questionnaire.

Total 60 participants fulfilled the inclusion criteria out of which 46 participants were males and 14 participants were females. Among 14 female participants having low back pain, 6 experienced moderate disability and 8 experienced minimal disability. Among 46 male participants having low back pain, 4 experienced moderate disability and 42 experienced minimal disability. In total 50 (83%) participants showed minimal disability and 10 (17%) participants showed moderate disability. This shows low back pain is common in karate practitioners and based on the results low back pain has minimal disability in karate practitioners.

In most cases low back pain disappears spontaneously; however, it is often recurrent and may develop into a chronic condition. <sup>[3]</sup>

In the sports context, these ailments often result from inappropriate biomechanical patterns, inappropriate warm-ups, technical errors, and improper training leading to repeated micro-injuries. Moreover, combat sports and martial arts are characterized by intense training. The length of trainings and the need to retain mental focus, combined with the all-too-frequent shortening of the time needed for tissue regeneration, can place a significant overload on the lumbar spine. [3]

According to Ambrozy et al. have shown that 46% of all karate injuries occur during sparring sessions in training situations, and 13.3% of all karate injuries are back injuries. [2] In Shotokan karate, the whole-body mass is involved and a rotation of the hips is performed to accelerate and increase the power of the punch. It is impossible to generate an equally large force with the use of the arm or shoulder only. The strength generated to the rotation of the hips is transferred by the spine to the chest muscles, then to the shoulders, upper extremities and fists, which translates to a technique of the greatest strength. The rotation of the hips adds significant acceleration to the movement of the extremities. [4] Athletes competing in kata display high explosive muscle strength, balance and flexibility, which is of key importance in this discipline. [4]

Gyaku-zuki (reverse punch) is one of the most common techniques which use hip rotation. The punch is delivered with the hand opposite to the front foot. Performing dynamic rotational movements of the torso in the zenkutsu - dachi, kokutsu - dachi and kiba - dachi stances may be the reason for overloading the lumbar spine. Factors which lead to the occurrence of back pain include hard physical work, lifting and carrying heavy objects, forced static body postures and work which involves rotational movements of the torso. [4]

The physics of Karate Shotokan shapes the athletes' movement habits by developing dynamics and precision, which is typical of fencers, at the expense of movement smoothness and endurance, more typical of boxers. The movements are violent and abrupt with low and unnatural body postures. [4]

Karate is a full-contact sport requiring full physical and mental attention, in which it is difficult to avoid overload of the spinal structures without knowledge of spinal pain syndrome prevention, anatomy, biomechanics, exercise physiology, and controlled biological renewal.

As in our study we had 60 participants, out of which 50 participants experienced minimal disability. Thus, our hypothesis is proved which signifies that there is low back pain disability in Karate practitioners.

## CONCLUSION

1. Low Back Pain commonly occurs in karate practitioners.
2. Based on the study's results it can be concluded that low back pain has minimal disability in karate practitioners.

## LIMITATIONS

1. The sample size was not equally distributed between males and females.

## CLINICAL IMPLICATION

1. Oswestry low back pain disability questionnaire can be used for karate practitioners having low back pain.
2. According to the level of disability of low back pain, in karate practitioners, intervention can be done to prevent further disability.

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